

R E M A R K S

Reconsideration of this application, as amended, is respectfully requested.

THE CLAIMS

Claim 1 has been amended to recite that the feedback circuit and the resonator of the oscillating unit cooperate with the amplifier means to enable oscillation at a predetermined frequency and that the switching means includes an electronic switch which receives a pulse signal indicating a transmission timing of a radar wave and changes an operating state of the oscillating unit to the oscillating state at a first level of the pulse signal and the oscillation stop state at first a second level of the pulse signal in order to intermit an output of the oscillation signal in response to a level of the pulse signal. In addition, claim 1 has been amended to recite the features of the amplifier means including an amplifier provided in an output stage of the oscillating unit, the oscillating unit having a power supply line for the amplifier means in the oscillating unit, and the switching means including a first switch which opens or closes the power supply line for the amplifier means in the oscillating unit based on the pulse signal indicating the transmission timing of the radar wave, thereby changing the

operating state of the oscillating unit to the oscillating state and the oscillation stop state.

Claim 2 has been amended to include subject matter from (now canceled) claim 10, and thus recites that the oscillating unit has a high frequency earth line, and the switching means includes a second switch which opens or closes between at least one of the input section and the output section of the amplifier means in the oscillating unit and the high frequency earth line of the oscillating unit based on the pulse signal indicating the transmission timing of the radar wave, thereby changing the operating state of the oscillating unit to the oscillating state and the oscillation stop state.

Claim 3 (which was withdrawn from consideration as being directed to a non-elected invention) has been amended to better accord with amended claim 1, and rejoinder of claim 3 is respectfully requested upon allowance of amended claim 1.

Claim 4-8 have been canceled.

Allowable claim 9 has been amended to be rewritten in independent form to include the subject matter of claim 1 from which claim 9 formerly depended.

Claim 10 has been canceled.

Claims 11 and 12 have been amended to recite that the oscillating unit has an element to set a resonance frequency of the oscillator in the oscillating unit to a frequency which

prevents a positive feedback from the output side to the input side of the amplifier means, thereby setting the resonance frequency outside of a normal operation range in the oscillating unit, and that the switching means includes a third switch which connects or disconnects the element to set the resonance frequency of the resonator in the oscillating unit outside of the normal operation range to and from the oscillating unit based on the pulse signal indicating the transmission timing of the radar wave, thereby changing the operating state of the oscillating unit to the oscillating state and the oscillation stop state.

Allowable claim 13 has been amended to be rewritten in independent form to include the subject matter of claims 1 and 2, from which claim 13 formerly depended.

Claims 14-17 (which were withdrawn from consideration as being directed to a non-elected invention) have been amended to better accord with amended claim 1, and rejoinder of claims 14-17 is respectfully requested upon allowance of amended claim 1.

And claims 18-25 have been canceled.

No new matter has been added, and it is respectfully requested that the amendments be approved and entered.

RE: THE REJECTION UNDER 35 USC 112

Claims 9, 11 and 13 have been amended to change the term "oscillation enable range" to "normal operation range" so as to

overcome the rejection of these claims under 35 USC 112. In addition, claim 7 has been canceled, thereby rendering the rejection of this claim under 35 USC 112 moot.

RE: THE PRIOR ART REJECTION

Claims 1, 2, 6-8 and 10-12 were rejected under 35 USC 103 as being unpatentable over the applicant's admitted prior art in view of USP 5334969 ("Abe et al"); claims 7 and 11 were rejected under 35 USC 103 as being unpatentable over the applicant's admitted prior art in view of Abe et al and JP 60-072306 ("Igawa et al"); and claims 8 and 12 were rejected under 35 USC 103 as being unpatentable over the applicant's admitted prior art in view of Abe et al and JP 40-011451 ("Oki et al"). These rejections, however, are respectfully traversed with respect to the claims as amended hereinabove.

The present invention as recited in amended independent claim 1 is directed to a radar oscillator including an oscillating unit having amplifier means, a feedback circuit which applies a positive feedback from an output side to an input side of the amplifier means and a resonator which resonates at the predetermined frequency. The feedback circuit and the resonator cooperate with the amplifier means to enable oscillation at a predetermined frequency. The resonator is connected to an input section or output section of the amplifier means and the

oscillating unit outputs and stops an oscillation signal having the predetermined frequency from the output side of the amplifier means in an oscillating state and an oscillation stop state, respectively. Switching means are connected to the oscillating unit and include an electronic switch which receives a pulse signal indicating a transmission timing of a radar wave and changes an operating state of the oscillating unit to the oscillating state at a first level of the pulse signal and the oscillation stop state at a second level of the pulse signal in order to intermit an output of the oscillation signal in response to a level of the pulse signal. The amplifier means includes an amplifier provided in an output stage of the oscillating unit, the oscillating unit has a power supply line for the amplifier means in the oscillating unit, and the switching means includes a first switch which opens or closes the power supply line for the amplifier means in the oscillating unit based on the pulse signal indicating the transmission timing of the radar wave, thereby changing the operating state of the oscillating unit to the oscillating state or the oscillation stop state.

Thus, according to the present invention as recited in amended claim 1, a switch is provided which opens or closes the power supply line for the amplifier means including the amplifier provided in the output stage of the radar oscillator, thereby changing the operating state of the oscillating unit to the

oscillating state or the oscillation stop state. As such, in the state where the power supply line for the amplifier means is opened by the switch, the oscillating unit as a whole, including the amplifier in the output stage of the radar oscillator, is brought to the operation stop state. As a result, leakage of the oscillation output does not occur in the operation stop state.

And with the structure of the present invention as recited in amended claim 1, an important advantage is achieved whereby leakage of oscillation output in the operation stop state is reduced and/or eliminated, and the width and interval of radar pulses can be set appropriately in accordance with a radar search range and an obstacle to be subjected to measurement.

It is respectfully submitted that the prior art cited by the Examiner does not disclose, teach or suggest a radar oscillator having the above described structural features and advantageous effects of the present invention as recited in amended claim 1.

Abe et al discloses a radar sensor 1 including an electromagnetic wave radiating portion 12 including an oscillation coil 12b, and an oscillation interrupting section 18 including a transistor 18b. In an oscillation state, the oscillation unit is turned on and off. In a non-oscillation stage it is inevitable that noise will leak from the output stage of the oscillation unit even though it is in the off state. Therefore, in Abe et al, a processing portion to remove the noise (noise component

extracting section 13 and the reference level generating portion 14) are provided.

In contrast to the present invention as recited in amended claim 1, however, Abe et al does not disclose a switch which opens or closes the power supply line to an amplifier means including an amplifier in an output stage of an oscillating unit. In Abe et al, there is no disclosed structural interrelationship between a switch and an amplifier in an output stage of the oscillation unit. Indeed, it does not appear that Abe et al includes an amplifier in an output stage of the oscillating unit and therefore cannot teach providing a switch to open or close a power supply to an amplifier means including such an amplifier.

Igawa et al discloses switching oscillatable high impedance and non-oscillatable low impedance. More specifically, in Igawa et al, the oscillator unit is brought to an oscillation stop state by lowering the value of Q of the tank circuit. In contrast to the present invention as recited in amended claim 1, however, Igawa et al does not disclose a switch which opens or closes the power supply line to an amplifier means including an amplifier in an output stage of an oscillating unit.

With respect to Oki et al, the Examiner states that the power supply line is a line to a switch 4 in Fig. 3. However, element 4 in Fig. 3 of Oki et al is not a switch but rather is a controller, and thus the line to element 4 is not a power supply

line but rather is a control line for the controller 4. Thus, in contrast to the structure of the present invention as recited in amended claim 1, Oki et al does not disclose a switch which opens or closes the power supply line to an amplifier means including an amplifier in an output stage of an oscillating unit.

In summary, it is respectfully submitted that none of Abe et al, Igawa et al, Oki et al and the applicant's admitted prior art discloses, teaches or suggests a switch which opens or closes the power supply line to an amplifier means including an amplifier in an output stage of an oscillating unit, as according to the present invention as recited in amended claim 1.

Accordingly, it is respectfully submitted that the present invention as recited in amended claim 1 and claims 2, 3, 11, 12 and 14-17 depending therefrom, clearly patentably distinguishes over applicant's admitted prior art, Abe et al, Igawa et al and Oki et al, taken singly or in any combination, under 35 USC 103.

RE: THE ALLOWABLE SUBJECT MATTER

The Examiner's indication of the allowability of the subject matter of claims 9 and 13 is respectfully acknowledged.

As noted above, claims 9 and 13 have been rewritten in independent form. Accordingly, it is respectfully requested that amended independent claims 9 and 13 are now in condition for immediate allowance.

In view of the foregoing, entry of this Amendment, allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,

/Douglas Holtz/

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